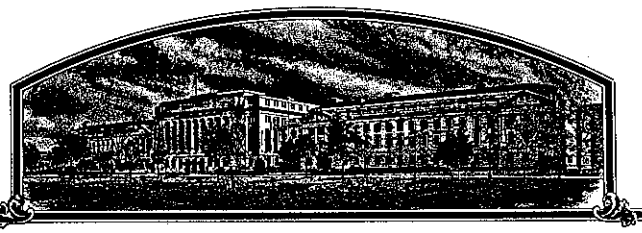
No. 8500086



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Edward J. Funk & Sons, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'DJ7'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 28th *day of* February *in the year of our Lord one thousand nine hundred and* eighty-six.

Attest:

Kenneth B. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Acting Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
WAREHOUSE & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

FORM APPROVED. OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION	3. VARIETY NAME
Edward J. Funk & Sons, Inc.	--	DJ7

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*	5. PHONE *(Include area code)*	FOR OFFICIAL USE ONLY
P.O. Box 67 601 Funk Parkway Kentland, IN 47951	(219) 474-5111	PVPO NUMBER 8500086

6. GENUS AND SPECIES NAME	7. FAMILY NAME *(Botanical)*	FILING DATE / TIME
Zea mays L.	Gramineae	3/27/85 2:30 ☐ A.M. ☒ P.M.

8. KIND NAME	9. DATE OF DETERMINATION	FEES RECEIVED
Yellow dent	March 1, 1981	AMOUNT FOR FILING $ 1,800 DATE 3/27/85 AMOUNT FOR CERTIFICATE $ DATE

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*

Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION	12. DATE OF INCORPORATION
Indiana	9/5/56

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

Dr. Sue Sullivan
Edward J. Funk & Sons, Inc.
P.O. Box 67
Kentland, IN 47951

PHONE *(Include area code)*: (219) 474-5111

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*

b. ☒ Exhibit B, Novelty Statement

c. ☒ Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*

d. ☒ Exhibit D, Additional Description of the Variety

e ☒ EXHIBIT E, STATEMENT OF BASIS OF OWNERSHIP RFS

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)*

☐ Yes *(If "Yes," answer items 16 and 17 below)* ☒ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ Yes ☐ No	☐ Foundation ☐ Registered ☐ Certified

18. DID THE APPLICANT(S) FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☐ Yes *(If "Yes," give date)*

☒ No

19 HAS THE VARIETY BEEN OFFERED FOR SALE OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

☐ Yes *(If "Yes," give names of countries and dates)*

☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT	DATE
Sue Sullivan	3/25/85
SIGNATURE OF APPLICANT	DATE

FORM WA-470 (3-84) (Formerly LMGS-470 (8-83) which is obsolete)

EXHIBIT A

Origin and Breeding of DJ7

DJ7 was derived from the cross B73xBS16 (Iowa early Eto synthetic) and subsequently backcrossed to B73 three times. Three generations of selfing and ear row selection followed until the uniform DJ7 selection was made in 1981. The first initial increase of the line was made in Hawaii during the winter of 1981-82. To date no known variants have occurred and the line is consistently uniform and stable in its phenotype from year to year.

8500086

EXHIBIT B

Novelty Statement

DJ7 resembles B73 in its phenotypic appearance and hybrid performance. DJ7 differs from B73 in the following ways (see Table 1):

1. DJ7 sheds pollen two days earlier than B73.
2. DJ7 silks 2.4 days earlier than B73.
3. DJ7 is 2.5" shorter than B73.
4. DJ7's ear height is three inches shorter than B73.

TABLE 1

Days to Flowering, Plant and Ear Height

Line	#Reps+	Flowering*								Plant Ht.(")			Ear Ht.(")		
		50% Pollen				50% Silk									
		1982	1983	1984	$\bar{x}$	1982	1983	1984	$\bar{x}$	1982	1984	$\bar{x}$	1982	1984	$\bar{x}$
B73	38	75.6	76.4	78.0	76.7	78.3	78.5	79.7	78.8	76	72	74.0	36	32	34
DJ7	41	73.2	74.3	76.4	74.6	75.2	76.0	78.0	76.4	69	74	71.5	30	32	31

+ Total number of reps (rows) over years.

* Days from planting to 50% pollen shed and 50% silk.

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-28
(2-15-74)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
(Corn)

OBJECTIVE DESCRIPTION OF VARIETY

CORN *(ZEA MAYS)*

NAME OF APPLICANT(S)
Edward J. Funk & Sons, Inc.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
P.O. Box 67
601 Funk Parkway
Kentland, IN 47951

FOR OFFICIAL USE ONLY

PVPO NUMBER 8500086

VARIETY NAME OR TEMPORARY DESIGNATION
DJ7

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. TYPE:

[2] 1 = SWEET 2 = DENT 3 = FLINT 4 = FLOUR 5 = POP 6 = ORNAMENTAL

2. REGION WHERE BEST ADAPTED IN THE U.S.A.:

[2] 1 = NORTHWEST 2 = NORTHCENTRAL 3 = NORTHEAST 4 = SOUTHEAST
5 = SOUTHCENTRAL 6 = SOUTHWEST 7 = MOST REGIONS

3. MATURITY (In Region of Best Adaptability): *(Under "Comments" (pg. 3) state how heat units were calculated)*

[7][6] DAYS FROM EMERGENCE TO 50% OF PLANTS IN SILK	[1][3][8][0]	HEAT UNITS
[N][A] DAYS FROM 50% SILK TO OPTIMUM EDIBLE QUALITY	[ ][ ][ ][ ]	HEAT UNITS
[5][5] DAYS FROM 50% SILK TO HARVEST AT 25% KERNEL MOISTURE	[2][5][7][0]	HEAT UNITS

4. PLANT:

[1][8][2] CM. HEIGHT (To tassel tip)

[0][7][9] CM. EAR HEIGHT (To base of top ear)

[2][0] CM. LENGTH OF TOP EAR INTERNODE

Number of Tillers:

[2] 1 = NONE 2 = 1–2 3 = 2–3 4 = > 3

Number of Ears Per Stalk:

[2] 1 = SINGLE 2 = SLIGHT TWO-EAR TENDENCY
3 = STRONG TWO-EAR TENDENCY 4 = THREE-EAR TENDENCY

Cytoplasm Type:

[1] 1 = NORMAL 2 = "T" 3 = "S" 4 = "C" 5 = OTHER (Specify) _____

5. LEAF (Field Corn Inbred Examples Given):

Color:

[3] 1 = LIGHT GREEN (HY) 2 = MEDIUM GREEN (WF9) 3 = DARK GREEN (B14) 4 = VERY DARK GREEN (K16F

Angle from Stalk (Upper half):

[1] 1 = < 30° 2 = 30–60° 3 = > 60°

Sheath Pubscence:

[2] 1 = LIGHT (W22) 2 = MEDIUM (WF9)
3 = HEAVY (OH26)

Marginal Waves:

[2] 1 = NONE (HY) 2 = FEW (WF9) 3 = MANY (OH7L)

Longitudinal Creases:

[2] 1 = ABSENT (OH51) 2 = FEW (OH56A)
3 = MANY (PA11)

Width:

[1][0] CM. WIDEST POINT OF EAR NODE LEAF

Length:

[0][7][5] CM. EAR NODE LEAF

[1][3] NUMBER OF LEAVES PER MATURE PLANT

8500086

6. TASSEL:

[0][6] NUMBER OF LATERAL BRANCHES

Branch Angle from Central Spike:

[1] 1 = < 30° 2 = 30–40° 3 = > 45°

Pendunce Length:

[ ][ ] CM. FROM TOP LEAF TO BASAL BRANCHES

Pollen Shed:

[2] 1 = LIGHT (WF9) 2 = MEDIUM 3 = HEAVY(KY21)

[6] Anther Color:
[6] Glume Color:
1 = YELLOW 2 = PINK 3 = RED 4 = PURPLE 5 = GREEN
6 = OTHER (Specify) Anther - purplish tan
Glume - purplish green

Pollen Restoration for Cytoplasms (0 = Not Tested, 1 = Partial, 2 = Good)

[0] "T" [0] "S" [0] "C" [ ] OTHER (Specify Cytoplasm and degrees of restoration) _____

7. EAR (Husked Ear Data Except When Stated Otherwise):

[1][5] CM LENGTH [5][5] MM. MID-POINT DIAMETER [1][2][7] GM. WEIGHT

Kernel Rows:

[2] 1 = INDISTINCT 2 = DISTINCT [1][8] NUMBER

[1] 1 = STRAIGHT 2 = SLIGHTLY CURVED 3 = SPIRAL

Silk Color (Exposed at Silking Stage):

[1] 1 = GREEN 2 = PINK 3 = SALMON 4 = RED

Husk Color:

[2] FRESH
[6] DRY
1 = LIGHT GREEN 2 = DARK GREEN 3 = PINK
4 = RED 5 = PURPLE 6 = BUFF

Husk Extention: (Harvest Stage)

[2] 1 = SHORT (Ears Exposed) 2 = MEDIUM (Barely Covering Ear)
3 = LONG (8–10CM Beyond Ear Tip)
4 = VERY LONG (> 10 CM)

Husk Leaf:

[2] 1 = SHORT (< 8 CM) 2 = MEDIUM (8–15 CM)
3 = LONG (> 15 CM)

Shank:

[ ][ ] CM LONG [ ] NO. OF INTERNODES

Position at Dry Husk Stage:

[1] 1 = UPRIGHT 2 = HORIZONTAL 3 = PENDENT

Taper:

[1] 1 = SLIGHT 2 = AVERAGE 3 = EXTREME

Drying Time (Unhusked Ear):

[2] 1 = SLOW 2 = AVERAGE 3 = FAST

8. KERNEL (Dried):

Size (From Ear Mid-Point):

[1][3] MM LONG [0][9] MM. WIDE [0][6] MM. THICK

Shape Grade (% Rounds)

[1] 1 = < 20 2 = 20–40 3 = 40–60 4 = 60–80 5 = > 80

8500086

[1] **Pericarp Color:** 1 = COLORLESS 2 = RED-WHITE 3 = TAN 4 = BRONZE 5 = BROWN 6 = LIGHT RED 7 = CHERRY RED 8 = VARIEGATED (Describe) _____

[1] **Aleurone Color:** 1 = HOMOZYGOUS 2 = SEGREGATING (Describe) _____

[1] 1 = WHITE 2 = PINK 3 = TAN 4 = BROWN 5 = BRONZE 6 = RED 7 = PURPLE 8 = PALE PURPLE 9 = VARIEGATED (Describe) _____

[3] **Endosperm Color:** 1 = WHITE 2 = PALE YELLOW 3 = YELLOW 4 = PINK-ORANGE 5 = WHITE CAP.

Endosperm Type:

[3] 1 = SWEET (su1) 2 = EXTRA SWEET (sh2) 3 = NORMAL STARCH 4 = HIGH AMYLOSE STARCH 5 = WAXY STARCH 6 = HIGH PROTEIN 7 = HIGH LYSINE 8 = OTHER (Specify) _____

[2][5] GM. WEIGHT /100 SEEDS (Unsized Sample)

9. **COB:**

[2][7] MM. DIAMETER AT MID-POINT

Strength:

[2] 1 = WEAK 2 = STRONG

Color:

[3] 1 = WHITE 2 = PINK 3 = RED 4 = BROWN 5 = VARIEGATED 6 OTHER (Specify) _____

10. **DISEASE RESISTANCE** (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

[0]	STALK ROT (Diplodia)	[0]	STALK ROT (Fusarium)	[0]	STALK ROT (Gibberella)
[0]	NORTHERN LEAF BLIGHT	[0]	SOUTHERN LEAF BLIGHT	[0]	SMUT
[0]	SOUTHERN RUST	[0]	CORN SMUT	[0]	BACTERIAL WILT
[0]	BACTERIAL LEAF BLIGHT	[0]	MAIZE DWARF MOSAIC	[0]	STUNT
[0]	OTHER (Specify)				

11. **INSECT RESISTANCT** (0 = Not Tested, 1 = Susceptible, 2 = Resistant):

[0]	CORNBORER	[0]	EARWORM	[0]	SAPBEETLE	[0]	APHID
[0]	ROOTWORM (Northern)	[0]	ROOTWORM (Western)				
[0]	ROOTWORM (Southern)	[0]	OTHER (Specify) _____				

12. **VARIETIES MOST CLOSELY RESEMBLING THAT SUBMITTED FOR THE CHARACTERS GIVEN:**

CHARACTER	VARIETY	CHARACTER	VARIETY
Maturity	B73	Kernel Type	B73
Plant Type	B73	Quality (Edible)	--
Ear Type	B73	Usage	B73

REFERENCES:

U.S. Department Agriculture. Yearbook 1937.

Corn: Culture, Processing, Products. 1970 Avi Publishing Company, Westport, Connecticut. (Numerous (Authors)

Emerson, R.A., G.W. Beadle, and A.C. Fraser. A Summary of Linkage Studies in Maize.Cornell A.E.S., Mem. 180. 1935.

The Mutants of Maize. 1968. Crop Science Society of America. Madison, Wisconsin.

Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S. Bul. 831. 1959.

Butler, D.R. 1954 – A System for the Classification of Corn Inbred Lines – PhD. Thesis, Ohio State University.

COMMENTS:

EXHIBIT D

Additional Information

A. Yield

DJ7 is improved over B73 as a seed parent due to higher yield. Table 2 shows DJ7 to be higher yielding and dryer at harvest than B73 in replicated trials. This is verified by company production yield data (Table 3) showing DJ7 to be 10 to 23 bushels/acre higher yielding than B73. The difference is even more pronounced in dry stress years. It is our opinion this is due to the earlier flowering of DJ7 and a tendency for DJ7 silk to remain viable longer under dry conditions.

TABLE 2

Harvest Yield and Moisture

	B73			DJ7		
	1981+	1982*	$\bar{x}$	1981+	1982*	$\bar{x}$
Bushels/Acre	64.7	66.0	65.4	75.3	85.1	80.2
% Moisture	38.8	24.6	31.7	34.8	22.0	28.4

+ 2 reps, RCB

* 4 reps, RCB

EXHIBIT D

Additional Information
(continued)

A. Yield (continued)

TABLE 3

Yield Summary

DJ7 versus B73 - All Pollinators*

Year	Inbred	Shelled Bu.	Female Acres	Shelled Bu./ Female Acre	DJ7 Advantage Bu./Acre
1983	B73	9,820	1401.0	7.01	+ 23.15
1983	DJ7	7,916	262.5	30.16	
1984	B73	64,843	1851.0	35.03	+ 10.75
1984	DJ7	48,301	1055.0	45.78	

While the above data depict DJ7's overall superiority in combination with various pollinators, the following data shows how DJ7 performed significantly better with LH38 in 1983 during severe heat and drought stress.

Pedigree	Female Acres	Bushels/ Female Acre	DJ7 Advantage Bu./Acre
DJ7xLH38	8	16.74	+ 13.88
B73xLH38	76	2.86	

The above data is from adjacent plantings in 1983. The ability of DJ7 to silk better than B73 under stress conditions accounts for this very significant difference in yield.

*Pollinators for DJ7 were LH38, LH47, LH50, LH51 and LH24. Pollinators for B73 were LH38, LH51, LH24, C123-11, Pa91, L30 and Va22.

EXHIBIT D

Additional Information
(continued)

B. Germination Data

DJ7xLH38 versus B73xLH38

Based on germination data from the 1984 crop, DJ7 exhibited superior cold germination scores especially in medium round and small round grade sizes. B73 historically shows germination problems in these specific grades.

*Cold Germination Data

DJ7xLH38 versus B73xLH38

	LR 26/21	LF 26/21	MR 21/17	MF 21/17	SR 17/15	SF 17/15	Plateless
DJ7xLH38	85.20	93.60	91.90	94.50	95.00	95.00	88.00
B73xLH38	84.00	96.00	86.00	95.50	87.00	94.50	86.00

DJ7 average cold germination, 91.4
B73 average cold germination, 89.1

DJ7 shows an overall advantage of 2.3 cold germination points and a 5.9 point advantage in the medium round size plus a 7.0 point advantage in the small round grade.

*Cold germination is conducted in actual soil medium, 10 days at 50°F and 4 days at 77°F.

EXHIBIT D

Additional Information
(continued)

B. Germination Data (continued)

Warm germination data also indicates an advantage with DJ7, notably in the medium and small round grades.

** Warm Germination Data

DJ7xLH38 versus B73xLH38

	LR 26/21	LF 26/21	MR 21/17	MF 21/17	SR 17/15	SF 17/15	Plateless
DJ7xLH38	97.13	97.35	97.81	98.50	96.26	98.00	97.50
B73xLH38	96.75	98.50	95.50	99.25	95.25	97.75	96.50

DJ7 average warm germination, 97.49
B73 average warm germination, 97.03

An overall warm germination advantage of .5 point is realized for DJ7 in all grades. The advantage noted in the medium round size is 2.31 for DJ7 and there is a 1.0 point advantage for DJ7 in the small round grade.

** Warm germination is a wet towel test; 7 days at 77°F.

EXHIBIT E

Corn Application #8500086; "DJ7"

The corn inbred line, DJ7, is solely owned by Edward J. Funk and Sons, Inc., and all rights to said line are held by the company.